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What is claimed is :

1. An apparatus for reverse iontophoresis configured such that it is contacted with a specimen comprising:
  - a base;
  - 5 an electrode provided on the base;
  - an electrolytic gel provided on the electrode adapted for contacting a first part of the specimen, and for extracting a molecule from the first part of the specimen;
  - 10 a sensor chip placed underneath the electrolytic gel and having a pigment membrane containing a pigment that changes a color by reaction with the molecule;
  - a light source irradiating light on the pigment membrane; and
  - 15 a light sensor receiving a reflection of the light from the pigment membrane.
2. The apparatus of claim 1, further comprising a conductive locating pin provided on the base.
- 20 3. The apparatus of claim 2, further comprising an on-chip electrode adapted for electrically connecting to the conductive locating pin through a locating hole of the sensor chip, and for contacting a second part
- 25 of the specimen.

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4. The apparatus of claim 3, further comprising a power supply having an anode and a cathode electrically connected to the electrode and the on-chip electrode respectively.

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5. The apparatus of claim 3, wherein the on-chip electrode is a gel electrode.

6. The apparatus of claim 1, further comprising a base electrode placed on the base adapted for contacting a second part of the specimen.

7. The apparatus of claim 6, further comprising a power supply having an anode and a cathode electrically connected to the electrode and the base electrode respectively.

8. The apparatus of claim 6, wherein the base electrode is a gel electrode.

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9. A method for reverse iontophoresis comprising:  
placing an electrolytic gel on an electrode connected to an anode of a power supply;  
contacting a first part of a specimen with the electrolytic gel and electrically connecting a second part of the specimen to a cathode of the power supply;

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- applying a voltage between the first part and the second part by the power supply and extracting a molecule from the specimen to the electrolytic gel and transferring the molecule from the electrolytic gel to
- 5 a pigment membrane;
- changing a color of the pigment membrane by reacting the molecule with the pigment membrane;
- irradiating a light on the pigment membrane; and
- measuring a change in intensity of the light caused
- 10 by the change in the color of the pigment membrane.
10. The method of claim 9, wherein the voltage ranges from 5 volts to 20 volts.
- 15 11. The method of claim 9, wherein the voltage is a pulse voltage.